

***CAMPTOTHECA LOWREYANA*, A NEW SPECIES OF ANTI—CANCER HAPPYTREES^{*}**

Shi—you Li

Arthur Temple College of Forestry, Stephen F. Austin State University, Nacogdoches, TX 75962, USA

Key words *Camptotheca lowreyana*, new species.

Camptotheca Decaisne (happytrees or Xi Shu, Nyssaceae) is a monotypic genus endemic to China. Its single species *C. acuminata* Decaisne (1873) has been the major source of Camptothecins, the promising anti—cancer and potential anti—viral drugs (Li and Adair 1994). The phenotypic analysis of the genus showed that (1) *C. yunnanensis* Dode (1908) should be treated as a species separated from *C. acuminata* (see Li, n.d.) and (2) a new species as the third species of the genus should be established. The present paper describes the new species as *C. lowreyana*. *C. lowreyana* has a potential in drug production according to the Camptothecin analysis (Li, unpublished).

***Camptotheca lowreyana* S. Y. Li, Sp. Nov.** (Figs. 1 and 2).

Type: China, Guangdong, Lianxian, You Ling Yao Pai, 18, Nov 1930, Xipeng Gao 50863 (holotype: BISC !; photos: ASTC !).

Additional specimens examined: Fujian: Dehua, west of the town, 1,110m, 9 Oct 1930, Buqin Zhong 219 (BISC, cultivated). Guangdong: Heping, Liyuan (Juntung), 400m, 12 Aug 1983, Guicai Zhang 448 (BISC); Huaiji, Dakengshan Tree Farm, 1,270m, 4 Mar 1995, Shiyu Li & Qanli Zhang 95410131 (ASTC, NEFI); Huaiji, Lengcheng, 100m, 11 Oct 1958, Yingguang Liu 3048 (HNNU, BISC); Huaiji, Shiyong, 700, 5 Mar 1995, Shiyu Li & Wanli Zhang 95410141 (ASTC, NEFI); Huaiji, Shiyong, 700m, Yionqian Cheng 170812 (BISC); Huaiji (Waitsap), Tangzhong, 7 Nov 1933, W. T. Tsang 23130 (A); Huaiji, Yaoshan Tree Farm, 7 Nov 1933, W. T. Tsang 23130 (BISC); Lechang, along river to Xikeng, 23 Oct 1928, Ying Jiang (Ying Tsiang) 1429 (A, BISC, E); Lechang, Xikeng, 18 Nov 1931, Xiangri Liang & Yingkun Huang 31442 (BISC, MO); Lianshan, Guohe (Da Long Shan), 200m, 1 Oct 1945, Shaqing Chen 5529 (BISC); Lianxian, Yaoan Tree Farm, 30 Jun 1984, Nanling Team 548104 (BISC). Long Tian, 27 Dec 1927, W. Y. Chun 5957

* 1996 年 12 月收稿.

(A); Nanxiong, Maozifeng Tree Farm, 10 Aug 1974, Guangdong Wood Survey Team 400476 (BISC); Qujiang, Xiaokeng Tree Farm, 13 Aug 1985, Guicai Zhang 834 (BISC); Yaoshan, mixed woods, 6 Oct 1936, C. Wang 40005 (A); Zijing, Jiouhe, 17 Jul 1958, Zhaofen Wei 120899 (KUN, BISC); Zijin, Yongkeng and Xiaobei, 250m, 25 Sep 1959, Shaoqing Chen 8386 (BISC). Guangxi: Debao, road to Tree Nursery, 500m, 29 Nov 1958, Zhaosai Zhang 13599 (BISC, cultivated). Hunan: Dongan, Shunhuangshan, 16 Aug 1953, Y. Liu s. n. (PE). Jianxi: Guixi, town, 100m, Shushen Lai 4046 (PE, cultivated). huichang: Field along rivers, 2 Jul 1958, Qiming Hu 2998 (PE, BISC, cultivated); Jinggangshan, Ciping, 730m, 12 Oct 1954, Lingsan Yao et al. 4948 (PE, cultivated); Jinggangshan, Huangpine, 7 Jul 1973, Xiangxue Yang 730450 (BISC, cultivated); Jinggangshan, Lingshan Yao et al. 4948 (PE, cultivated). Sichuan: Nanchuan, Jinfeshan, Oct 1939, C. Pei 7389 (PE).

Proposed common name: Lowrey happytree (Lowrey Xi Shu, 洛氏喜树).

Local names in China: Lang Dong Shu (浪洞树, in Huaiji of Guangdong) and Qing Yang Hua (青杨花, in Lianxian of Guangdong).

Species affinis *C. acuminatae* Decaisne, a qua differt foliis cordatus/vel ovatis (vs. ovalis), subtus viridulis, bracteolis 1.5—2.0mm longis (vs. 2.0—2.5mm longis), petalis 1.2—1.5mm longis (2.0—2.5mm longis) samaris cano—brunneis lucidis longioribusque circiter 26—32mm longis (vs. brunnis, 19—25mm longis), cotyledonibus penninervibus (vs. pinnipalmatis), nervis lateralibus saepissime 6—8 (vs. 2—4).

Camptotheca lowreyana is a deciduous tree species. It reaches 20m in height and 120cm in stem diameter in natural conditions (Li et al., n. d.). Bark is light gray and smooth at young ages, but deeply furrowed into ridges at maturity. Leaves are deciduous, cordate or ovate, with the widest point below the blade middle, slightly pubescent, entire but serrate in seedling stage, 12(10)—19(22)cm long and 7(5)—10(13)cm wide, lower surface greenish and lucid, lateral veins 14—18 on each side. Bracts are 1.5—2.0mm long. Petals are 1.2—1.5mm long. Pollens are very similar to those of other species of the genus, measuring 34.4 (28.6—40.2) μ m (polar axis) $\times$ 39.8 (34.5—42.5) μ m (equatorial axis) in size. The only significant difference is this species has more oblate pollens according to our examination (Li and Taylor, n. d.). Fruits are two or three thin-winged, gray—brown, smooth and lucid when dry, 26—32 (22—43)mm long and 5—7mm wide (Li, n. d.). Hypocotyl is green before primary leaf appears. Cotyledons are lanceolate 2—4cm long, about 1 cm wide, pinninerved, with 6—8 lateral veins on each side.

This new species differs from other taxa of the genus by its deeply furrowed bark, cordate or ovate leaves with greenish and lucid lower surface, gray—brown, smooth, lucid, and longer fruit (26—32mm long), and lanceolate, pinninerved cotyledon with 6—8 lateral veins on each side. In contrast, *C. acuminata* has slightly furrowed bark, oval or round leaves with grayish lower surface, yellow—brown, rugose, and shorter fruit (19—25mm long), and lanceolate, pinnipalmate cotyledon with 2—4 lateral veins on each side and making it distinctly different from *C. lowreyana* (Li, n. d.). However, *C. yunnanensis* has thin bark, semi—deciduous,

elliptic leaves, gray, smooth, lucid, thin three-winged short fruits, red hypocotyl (before primary leaf appears), and linear, pinnipalmate cotyledon with 2—4 lateral veins on each side.

The new species was named in honor of Lynn Lowrey at the Anderson Landscape and Nursery in Houston, Texas. Mr. Lowrey, a well-known botanist, plays an important role in initiating the happytree studies and encouraging my investigations.

ACKNOWLEDGMENTS

This project is sponsored by the Henry M. Rockwell Trust of College of Forestry at Stephen F. Austin State University (SFASU) and the Houston Livestock Show and Rodeo (HLSR). The field survey in China (December 1994—March 1995) conducted by the author and W. L. Zhang is also supported by the Open Research Laboratory of Forest Plant Ecology at Northeast Forestry University (NEFU), Harbin, China. I am indebted to Dr. K. T. Adair and Dr. R. S. Beasley (SFASU), Mr. T. R. Northrup (HLSR), Prof. S. Q. Nie, Dr. J. Li, and Dr. Y. G. Zu (NEFU), and D. G. Chen (Huaiji Forestry Bureau, Guangdong) for their support. This work would not have been possible without their efforts. I am very grateful to my wife Jie Liang Li and my friends L. Lowrey and K. Northrup (Northrup Associated, Inc.) for the encouragement and contributions. I acknowledge the curators of following herbaria for the assistance in specimen examination: A, ASTC, BM, C, CDBI, E, HNU, IBSC, K, KUN, MO, O, P, PE, SZ, and US. Special thanks go to Drs. D. Creech, D. McDonald, J. Taylor, H. Williams, P. R. Blackwell, and J. Van Kley (SFASU), Drs. J. J. Pipoly III and B. L. Lipscomb (Research Institute of Texas), Mr. M. Adams (East Texas Plant Materials Center) for providing advice and assistance. Appreciation and acknowledgments are extended to Drs. K. T. Adair and D. L. Culhavy (SFASU), Dr. D. E. Soltis (Washington State University), Dr. S. R. Manchester (University of Florida), and an anonymous reviewer for their critical comments on the early manuscript.

LITERATURE CITED

- LI, S. Y. n. d. Phenotypic variation of anti-cancer happytrees (*Camptotheca Decaisne*). Systematic Botany.
- LI, S. Y. and K. T. ADAIR. 1994. *Camptotheca acuminata* Decaisne, Xi, Shu, a promising anti-tumor and anti-viral tree for the 21 st century, 249 pages. Nacogdoches, Texas; A Henry M. Rockwell Monograph, college of Forestry, Stephen F. Austin State University.
- LI, S. Y. and J. TAYLOR. n. d. Surface micromorphology of anti-cancer happytrees (*Camptotheca Decaisne*). Sida.
- LI, S. Y., K. T. ADAIR, and W. L. ZHANG. n. d. Geography and ethnobotany of anti-cancer happytree (*Camptotheca Decaisne*) in China. Economic Botany.

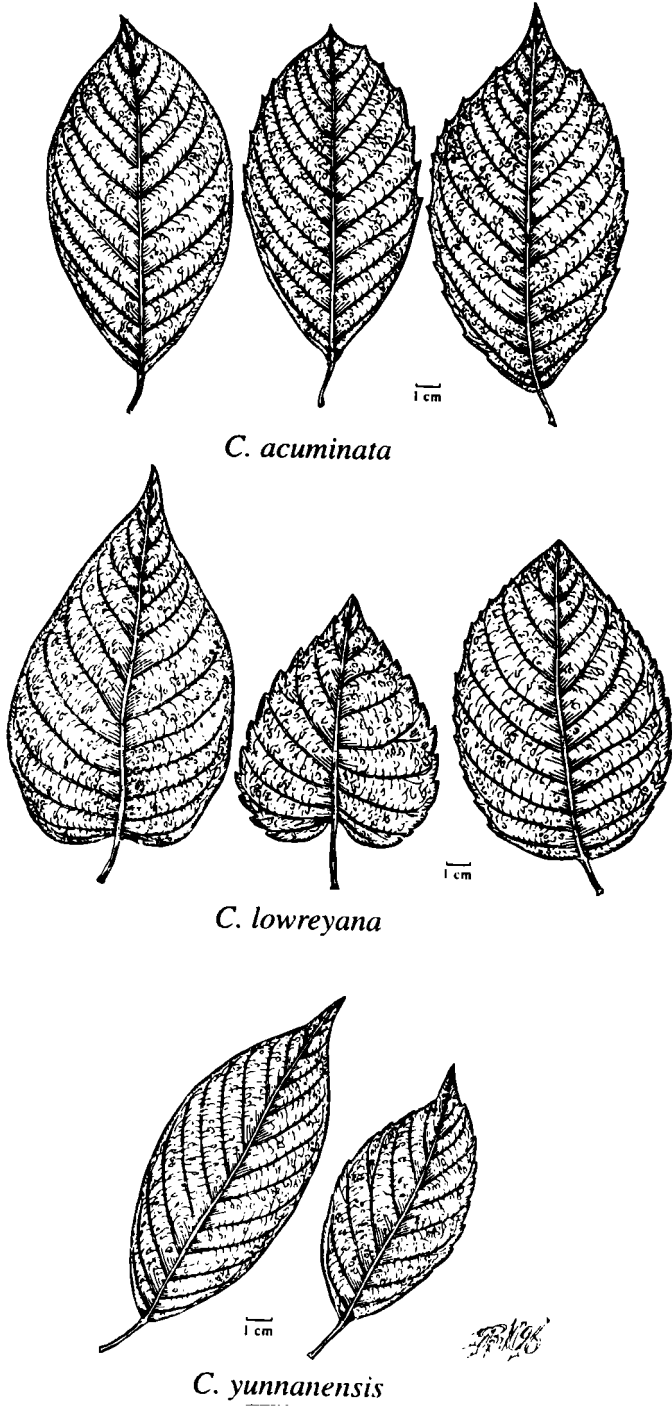


Fig. 1 Type of *C. lowreyana* (Xipeng Gao 50863, BISC, photo by Li, 1995).

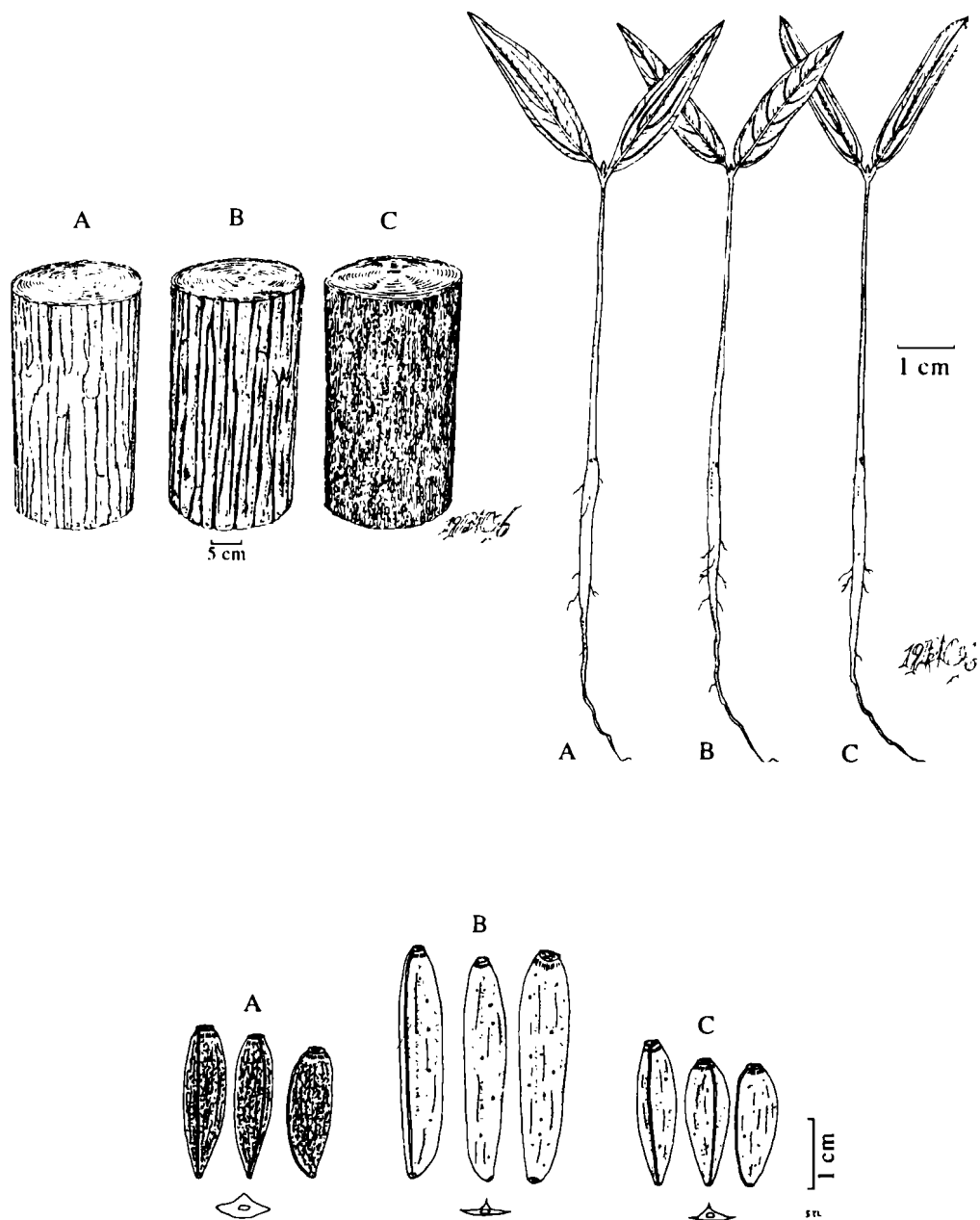


Fig. 2 Habitat of *C. lowreyana* (photo by Li, 1995).

